

Remarks

This second substitute amendment is submitted in response to the Advisory Action mailed June 20, 2006 and the second Advisory Action mailed August 4, 2006. The Final Rejection in this application was mailed March 23, 2006. A request for a two-months extension (a one-month having already been requested) and the associated fee (for a two-months extension minus the fee for a one-month extension) accompanies this substitute amendment.

Review and reconsideration of this application are respectfully requested in view of this second substitute amendment.

Claims 3-7 and 10-20 have been canceled. Claims 1-2, 8-9 and 21-22 remain in the present application.

No new matter has been added as a result of the amendments to claim 1, 2 and 8-9, nor is it believed that the amendments would cause any undue additional search or effort on the part of the Office.

The After Final Amendment filed June 6, 2006 was not entered because the Examiner alleges that the deletion of "as the tubular structure" in the third line of claim 20 raises new issues that would require further consideration and/or search.

The examiner further suggests that since claim 20 provides for the use of the tubular structure recited in lines 3-12, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass.

Applicant submitted a Substitute Amendment to replace the prior Amendment after final wherein claim 20 was canceled.

At page 4 of the Advisory Action mailed June 20, 2006, the examiner alleges that that

applicant's statement "[g]as relates to the state of the material" is unsupported and that applicant has not provided convincing evidence showing that Igarashi et al intends "gas" to refer solely, or at all, to "state of the material". In this regard, applicant refers to "The American Heritage Dictionary of the English Language, New College Edition" which defines "gas" as "[t]he state of matter distinguished from the solid and liquid states...", and further to "Hawley's Condensed Chemical Dictionary, Twelfth Edition", which defines "gas" as "[a] state of matter...".

The examiner has pointed to page 12 of the After Final Amdt. And suggests that applicant's statement that "[t]he saponified ethylene-vinyl acetate copolymer of Igarashi et al is more appropriately characterized as being a CPA-ethylene-vinyl acetate-saponified vinyl acetate - vinyl alcohol terpolymer when the degree of saponification is less than 100%" is incorrect (and unsupported). The examiner is totally correct. This statement is an inadvertent editorial error on the part of the applicant. What Applicant intended to say was that the saponified ethylene-vinyl acetate copolymer of Igarashi et al is more appropriately characterized as being a ~~CPA-~~ an ethylene-vinyl acetate-vinyl alcohol terpolymer. Applicant apologizes for such error.

In a second Advisory Action mailed August 4, 2006, the examiner refused to enter the Substitute Amendment after final because it is alleged that the addition of the recitation "consisting essentially of" to claim 1 requires further consideration and/or search since the combination of a tubular structure consisting essentially of about 30 to 75% of an ethylene-vinyl acetate copolymer and about 25 to 70% of one or more of the claimed additives has not been presented in any of the claims in the previous claim sets. Actually, such disclosure was present in canceled claim 6.

By this Second Substitute Amendment applicant has now amended claim 1 to replace the term "consisting essentially of" with "comprising" which was in claim 1 prior to the Amendment after final submitted June 1, 2006. In the first Advisory Action, the examiner did not considered the term "comprising" in claim 1 to be a reason for not entering the Amendment after final. Therefore, applicant submits that claim 1 which defined the "tubular structure comprising" is

deemed appropriate. Accordingly, in view of the present amendment to claim 1 and the previous cancellation of claim 20, it is believed that this Second Substitute Amendment after final should now be entered. Accordingly, applicant respectfully requests that this substitute amendment be entered and the application be reconsidered in view of the above amendments and the following remarks.

The tubular structure of the present invention, as defined in claim 1 (the only independent claim remaining), comprises about 30 to 75% of an ethylene-vinyl acetate copolymer and about 25 to 70% of one or more additives selected from the group consisting of process aids, fillers, plasticizers, metal oxides, metal hydroxides, peroxides, coagents, antioxidants and combinations thereof.

Igarashi et al., on the other hand, teach a refrigeration transport hose comprising an inner tube comprising a refrigerant gas-impermeable resinous layer formed of a very specific polyamide resin produced by the reaction of hexamethylene diamine and an aliphatic dicarboxylic acid having eight to sixteen carbon atoms (CPA resin); an outer rubber layer; and a reinforcing fiber layer between the inner layer and the outer layer. Igarashi et al have found that common polyamides resins are not suitable and that only the specific polyamide resin produced by condensation of hexamethylene diamine and an aliphatic dicarboxylic acid whose molecule has 8 to 16 carbon atoms is satisfactory in regard to the three requirements (of their invention), i.e., high gas impermeability, flexibility and heat resistance (col. 2, lines 33-43). In one embodiment, the inner layer contains 100% of the CPA resin (col. 3, lines 30-31). In a second embodiment, the inner layer further contains a saponified ethylene-vinyl acetate copolymer in addition to the CPA resin (col. 3, lines 32-34). The examiner alleges that the saponified ethylene-vinyl acetate copolymer of Igarashi et al contains ethylene-vinyl acetate copolymer, but provides no evidence to support his allegation other than to state that saponified ethylene-vinyl acetate copolymer is an ethylene-vinyl acetate copolymer because it is a copolymer that has repeating units of ethylene and vinyl acetate.

Applicant submits that simply because the saponified ethylene-vinyl acetate copolymer

contains pendent acetate groups does not make the polymer an ethylene vinyl acetate copolymer. Nor does the saponification of an ethylene-vinyl acetate copolymer provide a polymeric mixture of ethylene-vinyl acetate copolymer and ethylene-vinyl alcohol copolymer. Once the saponification has occurred, the resulting polymer product is either an ethylene-vinyl acetate-vinyl alcohol terpolymer or an ethylene-vinyl alcohol copolymer, depending on the degree of saponification. Applicant contends that chemically and structurally, ethylene-vinyl acetate copolymers and saponified ethylene-vinyl acetate copolymers are distinctly different from one another. Ethylene-vinyl acetate copolymer has the structure (1):



(1)

while saponified ethylene-vinyl acetate copolymer (ethylene-vinyl acetate-vinyl alcohol terpolymer where less than all of the pendant acetate groups are converted, i.e., saponification is less than 100%) has the structure (2):



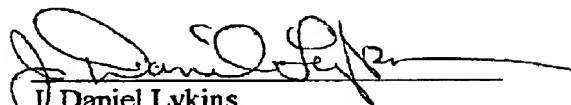
(2)

When saponification is 100% where all of the pendant acetate groups have been converted to hydroxyl groups, the saponified ethylene-vinyl acetate copolymer is polyvinyl alcohol. As shown in structure (2), the polymer chain contains "m-n" acetate groups and also contains "n" hydroxyl groups, and the resulting polymer is an ethylene-vinyl acetate-vinyl alcohol terpolymer. The numerical values of the numerals "m-n" and "n" are determined by the degree of saponification. When the value of "n" is equal to the value of "m", saponification has reached 100% and there is no longer any pendant acetate groups present in the polymer chain; therefore, the resulting polymer is an ethylene-vinyl alcohol copolymer. When the value of "m" is larger than "n" and "n" is not zero, the resulting polymer is ethylene-vinyl acetate-vinyl alcohol terpolymer (structure 2). Where "n" is zero, the polymer is not a saponified ethylene-vinyl acetate copolymer. Igarashi

et al recommends that the saponified ethylene-vinyl acetate copolymer contain not more than 40 mol % of ethylene and not less than 90 mol % vinyl acetate of the ethylene-vinyl acetate be saponified (col. 3, lines 39-42). A person skilled in the art would recognize the distinctions between a saponified ethylene-vinyl acetate copolymer and an ethylene-vinyl acetate copolymer and, furthermore, such person skilled in the art would understand that the two polymers have different characteristics and properties, in addition to having different structures. Actually, Igarashi et al desires that not less than 90% of the vinyl acetate of the ethylene-vinyl acetate copolymer be saponified. If the degree of saponification of the vinyl acetate is below 90 mol % the heat resistance of the product formed of the resinous composition tends to be lowered to an insufficient level (col. 3, lines 39-47). As seen from structure (2) above, ethylene-vinyl acetate-vinyl alcohol terpolymers where the numerical value of the numeral "n" is nearly equal to the numerical value of "m", i.e., the saponified ethylene-vinyl acetate copolymer (ethylene-vinyl acetate-vinyl alcohol terpolymer) contains relatively few pendant acetate groups compared to the relatively high number of pendant hydroxyl groups. Such example is exemplary of a saponified ethylene-vinyl acetate copolymer where the saponification is relatively high, e.g., greater than about 90 mol %.

In view of the forgoing amendments and remarks, it is believed that the present application is now in condition for allowance and an early indication thereof is earnestly solicited.

Respectfully submitted,


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